



**City of Santa Barbara**  
Airport Department

Meeting: 08/21/19  
Agenda Item No. 7

**Memorandum**

**DATE:** August 21, 2019  
**TO:** Airport Commission  
**FROM:** Henry Thompson, Airport Director   
**SUBJECT:** 2018 Integrated Pest Management Annual Report

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**Recommendation:**

That Airport Commission accept the Santa Barbara Integrated Pest Management Strategy, 2018 Annual Report, prepared February 2019.

**Background:**

The City of Santa Barbara adopted an Integrated Pest Management (IPM) strategy in January 2004 to reduce the amount and toxicity of pesticides used by the City and, where feasible, to eliminate pesticide use in public areas using alternative methods. This report highlights the Airport portions of the attached Draft 2018 IPM Annual Report.

In February 2006, the City Council approved the Pesticide Hazard and Exposure Reduction (PHAER) Zone model. In that model, areas of the Airport were mapped based on potential human and environmental pesticide hazard and exposure risk, as green, yellow or special circumstance (red) zones. Accordingly pest control products were evaluated on a range of human and environmental toxicity measures and rated as green, yellow or special circumstance (red). On a continuum, green products have low human and environmental toxicity, while there is high concern over the human and/or environmental toxicity traits associated with special circumstance (red) products. Zones are designated by their potential for pesticide contamination of humans and sensitive habitat. Green zones are areas of high potential for exposure, while red zones are areas of low potential for exposure. The model informs an applicator of the appropriate type of products that are appropriate to use in a specific area of the City.

**Airport Department Pesticide Use:**

Airport pesticide applications concentrated on three types of pests in 2018: mosquitoes, weeds and rodents.

**Mosquitoes**

In 2018 Airport, relied primarily on Altosid XR, a Methoprene based, yellow, extended release larvicide and Vectobac G, a green BTI based materials to control mosquito sources in the Goleta Slough. The Mosquito and Vector Management District (MVMD) of Santa

Barbara County monitors mosquito populations and performs control activities for the Airport to prevent transmission of West Nile Virus and other diseases.

In 2018 the Mosquito and Vector Management District applied 566.4 lbs of Altosid XR and 354.7 lbs of Vectobac G on the Airport's behalf, to control mosquito sources in and around the Goleta Slough.

### Weeds

As a commercial service airport, Santa Barbara Airport is required by 14 CFR Part 139 to maintain unobstructed visibility of lights and signs on the airfield. Airfield lights and signs are used by pilots to safely navigate the airfield during takeoff, landing and surface maneuvers. In 2028 Airport used the yellow product Roundup ProMax to maintain the airfield as needed for safe aircraft operations and to preserve infrastructure.

Roundup was selected as the least toxic alternative for use in weed control on the airfield in accordance with the City's Integrated Pest Management Strategy and the Pesticide Hazard and Exposure Reduction (PHAER) Zone system.

The rationale for chemical weed control versus mechanical control on the airfield is two-fold. Chemical control promotes safety by minimizing worker exposure to the high energy, high decibel, active airfield environment, and prevents unnecessary runway closures required to allow men and equipment to access safety areas closest to runway edges. Chemical control allows for one periodic application that can be accomplished between aircraft operations. With this approach, weeds are controlled without impacting aircraft operations and with minimal direct staff exposure to a hazardous work environment.

While the airfield at SBA is very large, staff employ several strategies to minimize the amount of glyphosate applied annually.

- Use lowest concentration of material needed to control vegetation.
  - Apply material when plants are small, actively growing and easier to control.
- Use proven techniques to maximize material efficacy.
- Apply material to the minimum area needed to maintain visibility of lights and signs.
- Apply using a hand sprayer, not boom, to more efficiently direct material only where needed.
- Use mechanical means for spot control.

To protect workers applying the material, all applications are made by, or under the direction of, a licensed pesticide applicator, in compliance with product label instructions, including use of personal protective equipment (PPE).

A small amount of yellow materials were also used, consistent with PHAER designations, on the Hollister Avenue traffic islands and adjacent to parking lots at the airline terminal.

For 2018, Airport applied the following herbicides:

- 56 gallons of Roundup Promax (yellow liquid)

#### Rodents

Airport used multi-feed, diphacinone based products to control ground squirrel populations during 2018. Rodents on the Airport attract predators that pose a collision hazard for aircraft. Rodents also create an FAA compliance issue by undermining and creating uneven surfaces in runway safety areas. The Airport is required by FAA to maintain safety areas in a smooth, compact condition. On-going rodent control is necessary to maintain a safe environment for aircraft operations.

Airport applied 100 pounds of Wilco Squirrel Bait, a yellow material, in 2018.

#### **Alternatives Used:**

Alternative efforts in 2018 focused on weed control, rodent control and bee swarm/hive relocation. Weed control efforts consisted of mechanical control efforts including hand weeding and weed eating. Airport has an on-going mechanical control program for rats and mice around the Airport that eliminates many of these pests before they enter a building or cause damage elsewhere. Additionally Airport staff use mechanical control methods to reduce the population of gophers outside of the airfield fence in landscaped areas. A total of 789 hours of alternative efforts were documented in 2018.

#### **Citywide IPM Effort Totals:**

To minimize direct and indirect human health and safety hazards posed by pests at the Airport, the Department is again a major user of pesticides in the city. Airport Department used 85% of all green tier pesticides, 99% of the yellow tier pesticides citywide. The Airport Department used no red tier pesticides in 2018.

#### **2019 Strategy Changes:**

For 2019 the Airport Department will continue to use pesticides primarily to control airfield weeds and mosquitoes. For weed control, Airport will continue to use the least toxic, effective product for control. If more evidence is found that changes the tier designation for glyphosate based products, Airport will reevaluate available products to insure that the least toxic approach is used.

**PREPARED BY:** Facilities and Maintenance

**ATTACHMENT:** Integrated Pest Management Strategy 2018 Annual Report - Draft

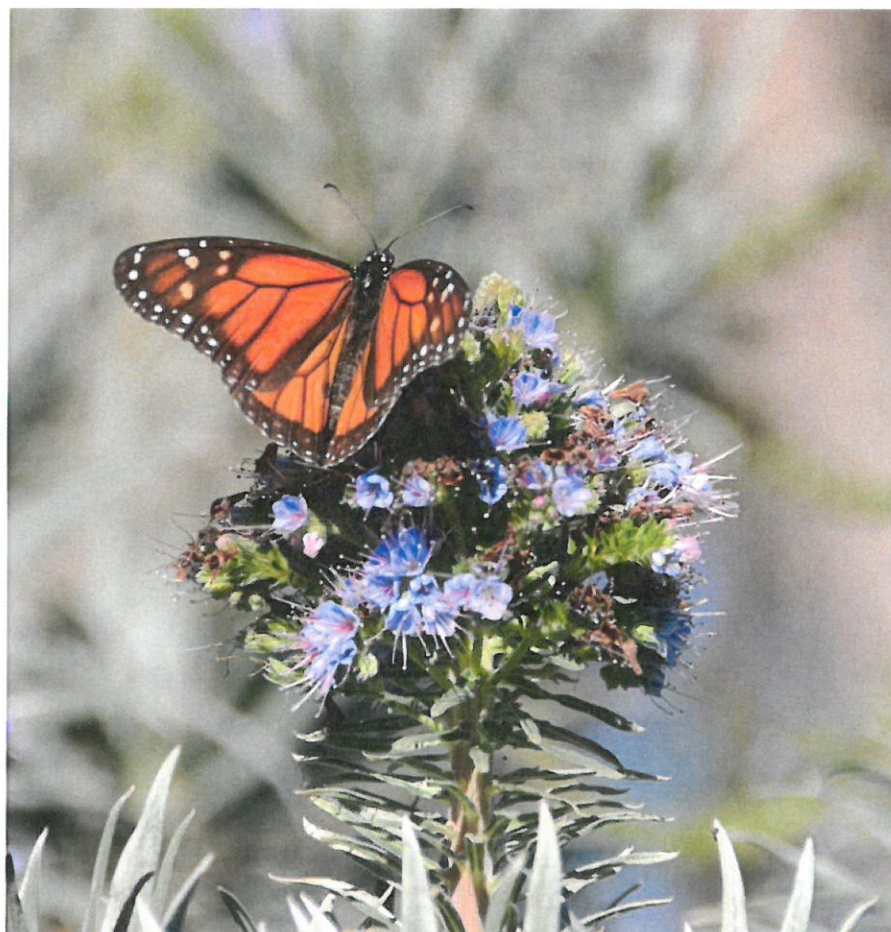




**City of Santa Barbara  
Integrated Pest Management Strategy**

**DRAFT 2018 Annual Report**

**Prepared February 2019 - Revised**



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## **I. BACKGROUND**

In January 2004, the City of Santa Barbara (City) adopted a City-wide Integrated Pest Management (IPM) Strategy to reduce pesticide hazards on City property and promote effective pest management.

The IPM Strategy contains the mission and purpose, assigns responsibilities, and outlines pest management processes, among other things. In addition, the Strategy requires an annual report be prepared that addresses the following:

- Types of pest problems encountered by each Department
- Types and quantities of pesticides used by each Department
- Exemptions in place and granted during the past year
- Alternatives used for phased out pesticides
- Alternatives proposed for use within the next 12 months
- Effectiveness of any changes in practices implemented
- Planned changes to pest management practices

### **PHAER Zone System**

The IPM Strategy required the development of a "Zone System" tied to the IPM Approved Materials List to limit pesticide use based on potential human exposure. In February 2006, the City Council approved the PHAER Zone system to be incorporated into the IPM Strategy.

The PHAER Zone system assigns a Green, Yellow, or Special Circumstance/Red Zone designation to each site, or portions of sites, based upon the potential for exposure by humans and sensitive habitat to hazardous pesticides, and allows the use of carefully screened materials by zone designation. For example, Green Zones are areas of high exposure potential, and only pesticides designated as "Green", which show very limited human and environmental impacts, may be used. Yellow Zones are areas with less potential for harm from exposure, and a broader range of "Yellow" materials are permitted under the PHAER Zone system.

### **Citizen and Staff IPM Advisory Committees**

The City Council established the 5 member Citizen IPM Advisory Committee by Resolution No. 06-008. The members of the Committee are appointed by the Parks and Recreation Commission to serve two-year terms. The purpose of the Committee is to review and advise on the implementation of the City's Integrated Pest Management Strategy. The 2018 Citizen IPM Advisory Committee included the following representatives:

- Greg Chittick, Community at large
- Larry Saltzman, Pesticide Awareness and Alternative Coalition
- Kristen LaBonte, Community at large

The Citizen IPM Advisory Committee has had two positions that have remained unfilled for the past year due to a lack of applicants.

Department IPM Coordinators are appointed by Department Directors to serve on the Staff IPM Committee. In 2018, Department representatives included: Jeff McKee from the Airport, Joe Poire from Fire, Mike Wiltshire from Public Works, Karl Treiberg from the Waterfront, and Santos Escobar from Parks and Recreation (As of January 2019, Matthew Parker assumed the Parks and Recreation role.) The Staff IPM Committee continued to work effectively with the Citizen IPM

Advisory Committee to administer the IPM Strategy and oversee pest management practices. The Parks and Recreation Department coordinates both the Citizen and Staff IPM Committees and oversees the implementation of the City's IPM Program.

## **II. IPM 2018 STRATEGY RESULTS**

### **1. Citizen IPM Advisory Committee Actions**

The Citizen IPM Advisory Committee met once in 2018 to review the materials list and approve the 2017 IPM Annual Report. The Committee approved the 2017 report and materials list.



## 2. Pests Encountered

A variety of pests were encountered on City properties in 2018 as outlined in Table 1. Departments ranked their top three pest problems with the numbers 1, 2 and 3. Other pest problems encountered are asterisked (\*). Footnote annotations reference additional information including names of plant diseases, weeds, grasses, and specific insects. Due to the low rainfall, the overall abundance of these pests was down as compared to other non-drought years.

**Table 1. Pest Problems Encountered by Department/Division**

Pest Category	Specific Pest	Airport Department	Creeks Division	Golf Division	Parks Division	Downtown Parking Division	Environmental Services Division	Waterfront Department
Plant pests	Giant whitefly	*			*	*		
	Misc. plant insects			*	*2	3		
	Disease	*		1 <sup>1</sup>	*3	*		
Tree Pests	Oak Worm				*	2		
	Psyllids				*2			
	Various Pine Bark Beetle sp.				*			
Weeds	Invasives	*	1		1 <sup>4</sup>			
	General weeds	3	2	*	1	1		3
	Perennial grasses	*	3		1 <sup>5</sup>			*
Vertebrates	Gopher	2		3	2			*
	Ground Squirrel	*		2	*			*
	Gulls/ nuisance birds	*			*	*		2
	Moles			*	*			
	Raccoons	*		*				
	Skunks	*		*				
Human Health	Poison Oak	*			*			
	Bees, yellow jackets, etc.	*		*	3	*	2	
	Rats/ mice	*		*	*	*	3	1
	Mosquitoes	1		*	*		1	
Other	Termites	*					*	
	Roaches						*	
	Ants	*				*	*	
	Pigeons			*				
	Crows			*				

1. Golf reported these plant diseases (fungus): Anthracnose, Summer Patch, Brown Patch, Take-All Patch, and Rapid Blight.

2. Parks reported these plant insects: Lerp Psyllids, Mites, Oak Moths, Thrips, Aphids, Snails, Slugs, and Ants.

3. Parks reported these plant diseases: Leaf Spot, Mildew, Blight, Pink Bud Rot, Sooty Mold, *Pythium*, *Armillaria*, and *Phytophthora*.
4. Parks reported these invasive weeds: Arrundo, Nutgrass, Kikuyu Grass, Clover, *Oxalis*, Malva, Foxtail, Spurge, Dandelion, Milkweed, Sow Thistle, *Poa annua*, Puncture Vine, Johnson Grass, and Poison Oak.
5. Parks reported the following perennial grasses: Crab, and Bermuda.
6. Creeks reported Giant Reed (*Arundo donax*) as the main invasive species in the creeks and riparian habitats. Other invasives include cape ivy, pampas grass, Bermuda grass, tree tobacco, castor bean, poison hemlock, and black mustard.

### 3. City-wide Pesticide Use

City Departments that applied pesticides, or contracted with pesticide applicators, also prepared monthly pesticide and alternative use reports, and participated in the preparation of this Annual Report. The monthly reports form the basis of the Annual Report and are available at the main offices of each Department.

Table 2 below provides a summary of total pesticide use (pesticides are reported in either pounds or gallons depending on whether they are dry or liquid) for 2018, including any increase or decrease in use from 2017. Use decreased 196% since 2017 for Green materials but increased for yellow material by 89%, primarily for mosquito control at the Airport. Red materials decreased by 258% from 2017 due to no termite fumigation activities at the Airport this year. Combined, all material applied decreased by 20% from 2017 levels.

**Table 2. 2018 Pesticide Use Summary**

	Material Use			
	Green	Yellow	Red	Total
<b>Gallons</b>	<b>9.2</b>	<b>61.4</b>	<b>23.6</b>	<b>38.4</b>
<b>Pounds</b>	<b>409.3</b>	<b>666.4</b>	<b>2.7</b>	<b>1134.4</b>
<b>Total Change from 2017</b>	<b>-196%</b>	<b>+89%</b>	<b>-258%</b>	<b>-20%</b>

Table 3 presents a more in-depth look at pesticide use by Department/Division, including: pesticide tier and name, active ingredient, class of pesticide, units and number of applications. At the Department level, the Airport Department decreased the use of pesticides from 2017 by 50% overall for material applied in gallons and pounds. The Mosquito and Vector Management District applied 566 lbs. of Altosid (Yellow) and 355 lbs. of Vectobac (Green) on the Airport's behalf to control mosquito sources and prevent West Nile Virus and other disease transmission. Rodent control is an important part of the Airport's efforts to reduce bird strikes to aircraft, and to accomplish this, the Airport applied 100 lbs. of Wilco Ground Squirrel Bait to control squirrels. The Airport applied 56 gallons of Roundup (Yellow) to control weeds on the runway, in addition to manual weed control.

The Golf Division decreased its overall pesticide use by 48% from 2017, mainly because no Affirm (Yellow) or RoundUp (Yellow) were applied in 2018. However, the use of Red materials increased mainly due to the increased use of the fungicides Daconil and Proxy.

The Parks Division increased its use of Green alternative materials by 747%, to control weeds and slugs and snails, reducing the need for Yellow materials to provide control. The Parks Division used Sluggo (Green), Iron Phosphate, at Alice Keck Park Memorial Gardens and the Mission Rose Garden to combat slugs and snails. The Green materials Burn Out and Avenger were used for weed control at Cabrillo Ball Field, Harbor West Parking Lot, and Chase Palm Park. The Parks Division increased its use of Yellow materials by 64%, primarily in the herbicide glyphosate for weed control. No Red materials were used.

The Creeks Division applied .05 gallons (1:16 dilution rate) of the herbicide Polaris (Yellow) at Arundo treatment sites along Arroyo Burro Creek, throughout 6 applications. The application method for Arundo is to brush the material on freshly cut stumps.

The Public Works Department decreased use of pesticides by 80% from 2017. Vectobac G (Green) was applied 40 times over the course of the year for the treatment of mosquitos. As is typical, the majority of the pesticide was applied at the Andrée Clark Bird Refuge, with additional sites including: Lighthouse Creek at La Mesa Park; culvert at Dwight Murphy Field/Por La Mar;

ditch at 3015 Calle Noguera; creek, ditches and drains at Chase Palm Park; the channel at Municipal Tennis Courts on Old Coast Highway, the bioswale at the Honda Valley Preserve, ponds at Sylvan Park, Mission Creek below Foothill, and Laguna Channel. Public Works also applied .05 gallons each of Arilon and Advion (Yellow) for control of ants in facilities.

It is important to note that because pesticide use will vary from year to year, an increase or decrease from the previous year does not necessarily indicate a long-term trend. Many factors affect the amount of pesticides applied in any one year. This topic is further discussed in Section 7.



Table 3. Pesticide Use by Department/Division

Pesticide Name	Active Ingredient	Type	Airport Department		Creeks Division		Golf Division		Parks Division		Public Works Department		Applications				
			Gal	Lbs	Gal	Lbs	Gal	Lbs	Gal	Lbs	Gal	Lbs	Airport	Creeks	Golf	Parks	Public Works
Avenger	Citric Acid/Clove Oil	Herbicide							4.12							3	
Primo Maxx	Trinexapac-ethyl	Regulator					5								27		
Safer	K salts of fatty acids	Insecticide							0.1							2	
Sluggo	Iron Phosphate	Molluscicide								40						1	
Vectobac G	Bti	Insecticide		354.7								14.6	42				40
		<b>Green Totals</b>	0	354.7	0	0	5	0	4.22	40	0	14.6	42	0	27	6	40
Acelepryn	Chlorantaniliprole	Insecticide					0.56								2		
Advion Gel	Indoxacarb	Insecticide	0.19								0.05		9				4
Altosid XR	Methoprene	Insecticide		566.40									3				
Arilon	Indoxacarb	Insecticide									0.05						5
Polaris	Imazapyr	Herbicide			0.05								4	1		5	
Round-up Custom	Glyphosate	Herbicide	56						3							16	
Triology	Neem Oil	Fungicide							1.5							2	
Wilco	Diphacinone	Rodenticide		100									6				
		<b>Yellow Totals</b>	56.19	666.4	0.05	0	0.56	0	4.5	0	0.1	0	22	1	2	23	9
Bayleton Pro	Triadimefon	Fungicide					0.7								1		
Daconil	Chlorothalonil	Fungicide					9.9								4		
Dorado	Propiconazole	Fungicide					1.35								1		
Insignia	Pyraclostrobin	Fungicide					1.47								3		
Proxy	Ethephon	Regulator					10.2								3		
Velista	Penthiopyrad	Fungicide						2.7							1		
		<b>Red Totals</b>	0	0	0	0	23.62	2.7	0	0	0	0	0	0	13	0	0
		<b>Department Totals</b>	56.19	1021.1	0.05	0	29.18	2.7	8.72	40	0.1	14.6	64	1	42	29	49
<b>City-wide Totals:</b>			Gallon: 94.19										Pound: 1,078.400				
													Applications				
													185				



#### 4. EXEMPTIONS

Under the IPM Strategy and PHAER Zone system, exemptions may be granted when a pest outbreak poses an immediate threat to public health, employee safety, or will result in significant economic or environmental damage. Exemption requests are often made in anticipation of a particular pest outbreak and may be requested for one-time application or as a programmatic exemption for a set time period. The exemption process is outlined in the IPM Strategy.

No exemptions were requested in 2018, one (1) exemption was requested in 2017 and three (3) in 2016. This downward trend is due to Departments not proposing new materials or procedures, instead relying on the current adopted materials list.

**Table 4. Comparison of Exemptions for 2016, 2017, and 2018**

<b>Exemptions</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>
Number of Exemption Requests (total)	3	1	0
Number of Exemption Requests Approved	3	1	0
Number of Approved Exemption Requests Applied	3	1	0
Number of Approved Exemption Requests Not Applied	0	0	0

## 5. ALTERNATIVE PEST MANAGEMENT PRACTICES USED IN 2018

The use of non-chemical IPM alternatives are emphasized over pesticide applications. Hours reported for the total year are from the *Monthly Alternative Use Reports* prepared by each Department. Non-chemical pest management alternatives are presented in Table 7 and vary from year to year. A check (✓) indicates the alternative was used, but time was not tracked. City Departments track time using a variety of methods. Some Departments track Alternative Management Practices by issuing Work Orders, while some track time by having their staff fill out reports on their daily activities. Additionally, when time has been spent on Alternative Management Practices by contractors, they usually report the time spent to the Department that oversees the contract. Table 7 below presents a combination of staff time and contractor time when reported.

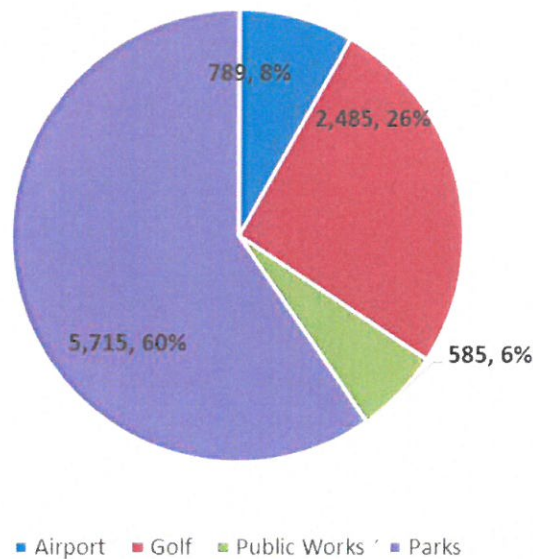
Of the tracked hours for City-wide alternative practices, there was a decrease of 22% from 12,198 hours in 2017 to 9,574 hours in 2018. As a whole, maintaining weeds through mulching, hand weeding, weed whipping and other practices accounts for 7,919 hours, 83% of the total time tracked; mechanical traps for gopher, squirrels, rats and mice control accounted for 15% of total tracked time, or 1,434 hours, bee control accounted for 221 hours, or 2% of total time tracked. Much of the City's rodent trapping and bee control are done by contractor.

**Table 5. Staff and Contractor Time Using Alternative Management Practices (hours)**

PEST	Alternative	Airport	Golf	Public Works	Parks	Creeks	Citywide Hours
WEEDS	Mulch & wood chips	17	125		194	✓	336
	Weed fabric				✓		0
	Propane flame weeder				✓		0
	Hand weeding	542	62		850	✓	1,454
	Weed whip	106	1,633	✓	4,006	✓	5,745
	Habitat modification				✓	✓	0
	Irrigation Mgmt.		384		✓		384
	Host plants squeeze out				✓		0
PLANT PESTS	Irrigation Mgmt.		✓		✓		0
	Compost tea/microbial in.		✓				0
	Enhance plant health		✓		✓		0
	Worm castings				✓		0
	Effective micro-organisms		✓		✓		0
	Wash off plants				✓		0
	Remove plant/tree				✓		0
GOPHERS	Traps	70	185		300		555
SQUIRRELS	Traps		96		92		188
RATS & MICE	Mechanical traps	54		364	273		691
	Cat						0
MOSQUITOES	Mosquito fish						0
	Remove stagnant water				✓		0
BEES	Bee Keepers			221	✓		221
OTHER	Glue traps/roaches						0
	Heat Treatment						0
<b>Total Hours</b>		<b>789</b>	<b>2,485</b>	<b>585</b>	<b>5,715</b>	<b>0</b>	<b>9,574</b>

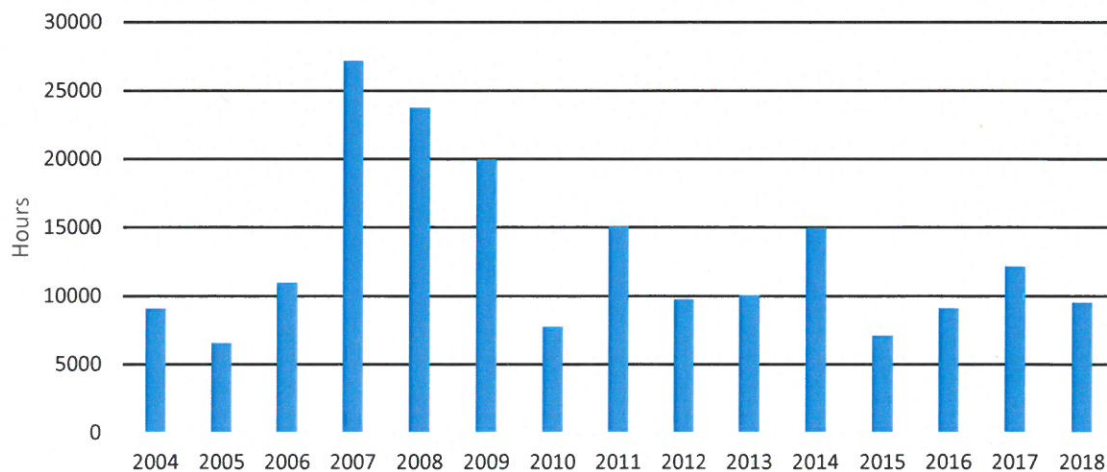
Figure 1 below compares the use of alternative methods (in hours) by Department/Division. Of the total 9,574 hours tracked using alternative methods the Parks Division accounted for 5,715 hours, or 60% of total time; the Golf Division accounted for 2,485 hours, or 26%; the Airport accounted for 789 hours, or 8% of total time; and Public Works accounted for 585 hours, or 6% of total time.

**Figure 1. Time Spent (hours) Using Alternative Methods by Department/Division**



A number of factors influence time spent on alternative practices including the number of staff available to perform alternative methods, department priorities, and severity of pest outbreak. Figure 2 reflects tracked hours by year since 2004. Though hours spent on alternative methods will vary from year to year, the City has averaged 13,000 hours on tracked alternative management practices. Weeding has historically been the category which most greatly affects time spent on alternative practices.

**Figure 2. 2018 Citywide Tracked Alternative Methods**



## 6. EFFECTIVENESS OF ALTERNATIVE PRACTICES IMPLEMENTED

In general, most alternative pest management practices are more labor intensive and costly, and not as effective as the use of Yellow and Red classified pesticides. While most Green materials and practices provide only moderate control of pest populations, there have been some successes.

The effectiveness of alternatives for the biggest pest problems encountered in an average year is reviewed below.

- **Weeds:** A variety of alternatives provide moderate effectiveness and control including: weeding, weed whipping, mulching, mowing, and using a flame torch in designated safe areas. These alternatives are significantly more labor and cost intensive and not as effective as Yellow materials such as Glyphosate. Alternative chemicals, such as clove oil or acid based herbicides, have not proven effective. This has resulted in a notable increase in weed populations, predominantly on parkland, that continues to have a negative effect on aesthetics and landscape health.
- **Insects / Mollusks:** Results are mixed for combating insects and mollusks. For some insects, there are no known effective alternatives. Some alternatives can be very effective but expensive, such as removing non-resistant plants and replacing them with resistant varieties. However, the following alternatives have proven successful against insects and mollusks:
  - Sluggo for snails and slugs
  - Worm castings for white fly
  - Insecticidal soap for aphids
  - Neem oil as a dormant spray
  - Bti and Spinisad for mosquitoes
  - Acelepryn for beetles
- **Disease:** No effective alternative has been found for most diseases. Where possible, staff focuses on preventative treatments to enhance plant health. Once disease strikes, a plant may be removed and replaced with a less susceptible plant. If a plant cannot be removed, pesticides are generally required to combat the disease.
- **Gophers:** For the most part, mechanical traps are being used City-wide. Traps have been found to be moderately effective and are more expensive than rodenticides due to higher costs of purchasing, installing, monitoring, and cleaning out traps.
- **Ground Squirrels:** Mechanical trapping, using snap traps, is the primary method of control at this time. This method is moderately effective at controlling populations. Both trapping and baiting have proven very labor intensive.
- **Mice / Rats:** At this time, traps are the primary way of controlling this population. Traps have been found to be effective depending on population size and location and available food sources. Positive public perception seems to far outweigh the costs of using traps. Traps are very effective in controlling rodents on downtown State Street and at Coast Village Road.
- **Termites:** Building Maintenance will use heat treatments to control drywood termites where appropriate. Heat was found to be equally effective as pesticides on smaller buildings with drywood termites. However, costs are 50% higher at this time, and heat is not effective on large structures or with subterranean termites.

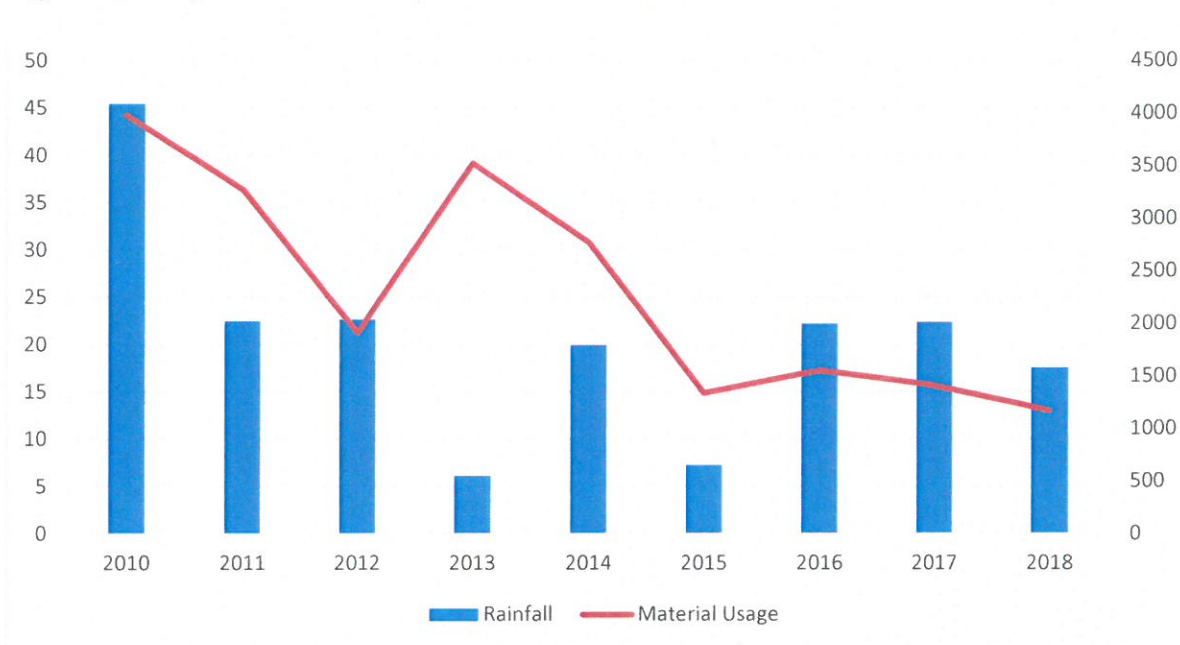


## 7. CONCLUSION

Many factors contribute to the use of pesticides as well as the tier of pesticides used. These include weather patterns (unseasonably dry or wet weather), introduction of new, or changes to existing pest populations, effectiveness of alternative methods, as well as the effectiveness and availability of certain pesticide materials. Such variances are, and will continue to be, a normal occurrence.

One of the main factors that determine pest populations is rainfall. More rain generally amounts to a greater population of insects and weeds, thus more pesticide use. Figure 3 compares annual rainfall with total pesticide use. With the exception of 2013 and 2014, the data indicates a greater use of pesticides during wetter years. 2013 pesticide use was influenced by the Goleta Slough being closed to the ocean, leading to an increased mosquito population around the Airport.

**Figure 3. Comparison of Annual Rainfall with Total Pesticide Use**



Because the number of factors that affect pesticide use can vary greatly from year to year, it is difficult to look at past pest management practices to predict future pesticide use. In addition, prior to implementing IPM and the PHAER Zone, pesticide use was analyzed only by the Parks Division and used at higher frequencies and in larger quantities<sup>1</sup>.

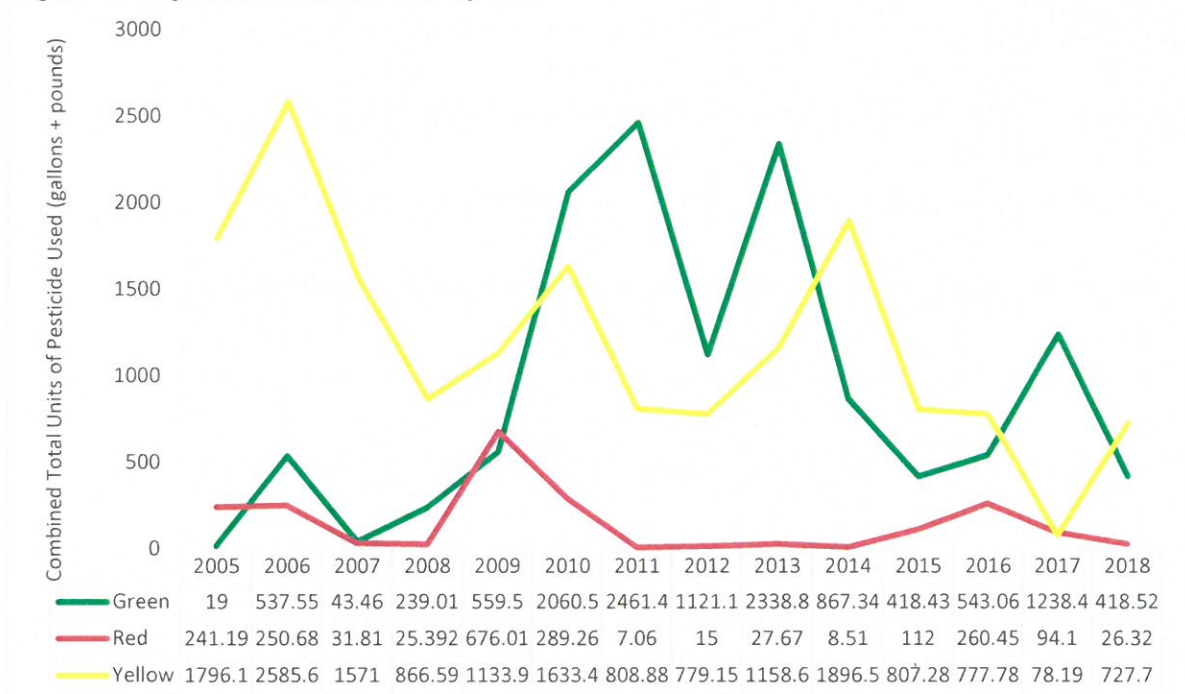
In addition, it should be noted that the amount of pesticides used and the number of applications are not necessarily accurate indicators of the extent of pesticide use or, conversely, the extent of use of reduced-risk pest management methods and alternative practices. For example, staff may apply several hundred small-scale "spot" applications targeted at problem areas rather than a few treatments of a large area. Further, staff may replace a more toxic pesticide used at a smaller quantity with a less hazardous compound that must be applied at a much larger quantity.

<sup>1</sup> Information based on staff and IPM Advisory Committee knowledge.



Figure 4 looks at the City's pesticide use by tier since 2005. The data indicates that an increase in Yellow and Red materials generally amounts to less Green material, though this is not always the case. 2010, for example, saw a higher than average use of both Red and Yellow material, while still using a significant amount of Green material. The *2010 Annual Report* indicates that 80% of all pesticide use in 2010 was for mosquito control. In fact, mosquito control accounts for the majority of pesticide use in any given year.

**Figure 4. Citywide Pesticide Use by Tier**



It is always important for City staff to find cost effective, low risk, viable alternatives to reduce pesticide hazards and to increase the overall efficiency of IPM practices. Additionally, changes in maintenance standards and expectations may be necessary if more Green materials are employed.

Also critical to reducing pesticide hazards in the City of Santa Barbara is the continuation of community outreach and public education. It is anticipated that with greater community outreach, the public will become more aware of low risk alternatives that they can employ at home, thus adding to the overall health of the community.

### III. PLAN FOR 2019

The Parks and Recreation Department will continue to administrate and refine the IPM Strategy.

All departments will continue to test any promising new materials or methods of integrated pest management as they are introduced.

On September, 19, 2017, the City Council adopted Resolution 17-097 designating Santa Barbara as a BEE CITY USA affiliate. The Parks and Recreation Department is the designated BEE CITY USA sponsor assigned to facilitate the program. The Department is authorized to conduct a celebration of National Pollinator Week, including publicity through signage and creation of a webpage containing BEE CITY USA and local affiliate contact information; develop and implement a program to create or expand pollinator-friendly habitat; establish and annually review a policy in the IPM Strategy relating to pollinator conservation, and identifying locations for pollinator-friendly plantings.

In 2019, the Staff will undertake a thorough review of its IPM Strategy and PHAER Zone Program with the goal of continuing to reduce its use of Yellow and Red materials. As part of this review, the commitment from the Department will include the following:

- Evaluate the current use of Yellow materials, specifically herbicides containing glyphosate, such as Roundup Pro, Roundup Custom, Rodeo, etc., considering alternatives such as experimenting with pre-emergent herbicides, where applicable, and continuing to experiment with exempt materials to support efforts in reducing pesticide use.
- Research and identify alternative methods, such as using contract labor and / or specialized equipment for weeding of the street medians, parkways, and other areas currently designated for the use of Yellow materials and their associated costs.
- Identify potential landscape enhancement projects that will provide value and benefit to the Department while addressing weed populations through creative design.
- Educate the public regarding the City's efforts in pesticide reduction and establish an acceptable baseline for weeds in parks, parkways, and street medians, and improve existing signage to include the website address and/or Quick Response (QR) codes to link the public to the City's website for information on the City's IPM Strategy and PHAER Zone Model in areas where herbicides are used annually.
- Work with the IPM Advisory Committee to review the IPM Strategy and PHAER Zone documents to determine if revisions are necessary.

Staff and the IPM Advisory Committee will continue to monitor research regarding impacts of pesticides on humans, wildlife and native habitats as well as begin a discussion on funding and staffing options for community education and outreach to reduce pesticide use on private property. It is staff's goal to bring back to the Parks and Recreation Commission with any recommendations for changes City's IPM Strategy and/or PHAER Zone Program.



## ATTACHMENTS

### ATTACHMENT A: APPROVED MATERIALS LIST

The pesticides listed on the Approved Materials List are categorized according to the pesticide screening protocol in the PHAER Zone system. It has been the practice of the IPM Committee to make adjustments to the Approved Materials List in the IPM Annual Report shown below. This list supersedes the version in the IPM Strategy and PHAER Zone. A mark in the Used column indicates this product was utilized during the reporting period.

Used	Product Name	Active Ingredient	ZONE	Type
	Advance Ant Bait	Orthoboric Acid	Green	Insecticide
	Advion Roach Stations (enclosed)	Indoxacarb	Green*	Insecticide
	AllDown	citric acid, acetic acid, garlic	Green	Herbicide
	Any brand name	Orthoboric Acid ant bait station	Green	Insecticide
X	Avenger	Citrus oil	Green	Herbicide
	Avert Cockroach Bait Station	Abamectin B1 0.05%	Green*	Insecticide
	Avert Cockroach Gel Bait	Abamectin B1 0.05%	Green*	Insecticide
	Bactimos Pellets	Bt	Green	Insecticide
	Bactimos Wettable	Bt	Green	Insecticide
	Bio-Weed	corn gluten	Green	Herbicide
	Borid Turbo	Orthoboric Acid	Green	Insecticide
	BurnOut 2	clove oil	Green	Herbicide
	Cease Biofungicide	B. subtilis	Green	Fungicide
	Cinnamite	cinnamaldehyde	Green	Insect/Fung
	Conserve	spinosad	Green	Insecticide
	Dipel Flowable	Bt	Green	Insecticide
	Drax Ant Kill PF	Orthoboric Acid	Green	Insecticide
	EcoExempt	Wintergreen Oil	Green	Herbicide
	EcoExempt D	2-Phenethyl propionate / Eugenol	Green	Insecticide
	Embark	mefluidide	Green	Growth Regulator
	GreenErgy	Citric, Acetic Acid	Green	Herbicide
	Kaligreen	potassium bicarbonate	Green	Fungicide
	Matran (EPA Registration Exempt)	clove oil	Green	Herbicide
	Natular	spinosad	Green	Insecticide
	Natura Weed-A-Tak	clove oil	Green	Herbicide
	Niban	Isoboric Acid 5%	Green	Insecticide
X	Primo-Maxx	Trinexapac-Ethyl	Green	Growth Regulator
X	Safer Soap	potassium salts of fatty acids	Green	Insecticide
X	Sluggo	iron phosphate	Green	Other



Used	Product Name	Active Ingredient	ZONE	Type
	Summit BTI Briquets	Bt	Green	Insecticide
	Teknar HP-D	Bti	Green	Insecticide
	Terro II	Orthoboric Acid	Green	Insecticide
X	Vectobac G	Btk	Green	Insecticide
	VectoLex CG	bacillus sphaericus	Green	Insecticide
	Victor Wasp and Hornet Killer	Mint Oil 8% & Sodium Lauryl Sulfate 1%	Green	Insecticide
X	Acelepryn	Chlorantraniliprole	Yellow	Insecticide
	Advion Ant Arena	Indoxacarb	Yellow	Insecticide
X	Advion Roach Gel	Indoxacarb	Yellow	Insecticide
	Advion Insect Granules	Indoxacarb	Yellow	Insecticide
	Affirm	Polyoxin D zinc salt	Yellow	Fungicide
	Agnique MMF	POE Isoocatadecanol	Yellow	Insecticide
	Aliette	fosetyl aluminum	Yellow	Fungicide
	Altosid Briquettes	methoprene	Yellow	Other
	Altosid Liquid	methoprene	Yellow	Other
	Altosid Pellets	methoprene	Yellow	Other
X	Altosid XR-B	methoprene	Yellow	Other
	Aquamaster-Rodeo	glyphosate	Yellow	Herbicide
X	Arilon	Indoxacarb	Yellow	Insecticide
	Avid	abamectin	Yellow	Miticide/Insecticide
	Ditrac	Diphacinone	Yellow	Rodenticide
	Dormant	petroleum oil	Yellow	Insecticide
	Green Light	Neem oil	Yellow	Insecticide/Fungicide
	Kop-R-Spray	Copper Oil	Yellow	Fungicide
	M-PEDE	potassium salts of fatty acids	Yellow	Insecticide
	Omni Oil	Mineral Oil	Yellow	Fungicide
X	Polaris	Imazapyr	Yellow	Herbicide
	Prostar 70 WP	flutolanil	Yellow	Fungicide
	Rose Defense	Neem oil	Yellow	Insect/Fung
X	Roundup Custom	glyphosate	Yellow	Herbicide
	Roundup PROMAX	glyphosate	Yellow	Herbicide
	Safticide Oil	petroleum oil	Yellow	Insecticide
	Stylet Oil	Petroleum distillates	Yellow	Insecticide
	Sulf-R-Spray	Parafin oil, sulfur	Yellow	Fungicide
	Razerooter	Diquat	Yellow	Herbicide
	Superior Spray Oil	petroleum distillates	Yellow	Insecticide
	Surflan	oryzalin	Yellow	Herbicide
	Surflan AS	oryzalin	Yellow	Herbicide
	Termidor SC	Fipronil	Yellow	Insecticide
	Triact	Neem oil	Yellow	Insecticide/Fungicide
X	Trilogy	Neem oil	Yellow	Insecticide/Fungicide



Used	Product Name	Active Ingredient	ZONE	Type
	Wasp-Freeze	allethrin	Yellow	Insecticide
X	Wilco Ground Squirrel Bait	diphacinone	Yellow	Other
	XL 2G	benefin; oryzalin	Yellow	Herbicide
X	Bayleton	triadimafon triazole	Red	Fungicide
X	Daconil	Chlorothalonil	Red.	Fungicide
	Dorado	Propiconazole	Red	Fungicide
	Fumitoxin	Aluminum phosphide	Red	Rodenticide
X	Insignia	Pyraclostrobin	Red	Fungicide
	Heritage	Azoxystrobin	Red	Fungicide
	Manage	halosulfuron methyl	Red	Herbicide
	Medallion	fludioxonil	Red	Fungicide
	Quick Pro	glyphosate/diquat	Red	Herbicide
X	Proxy	Ethephon	Red	Growth Regulator
	Reward	diquat dibromide	Red	Herbicide
	Rubigan	fenarimol	Red	Fungicide
	Rubigan EC	fenarimol	Red	Fungicide
	Subdue	metalaxyl	Red	Fungicide
	Trimmit 2SC	Paclobutrazol	Red	Growth Regulator
	Turflon	Triclopyr	Red	Herbicide
X	Velista	Penthiopyrad	Red	Fungicide
	Zp Rode	Zinc phosphide	Red	Rodenticide
	Zythor	Sulfuryl flouride	Red	Insecticide

\* By decision of the Citizen IPM Advisory Committee, chemicals that may be classified normally as Yellow materials may be classified as Green materials if they are entirely enclosed in factory sealed bait stations.